INFORMATION MEDICINE

THE REVOLUTIONARY CELL-REPROGRAMMING DISCOVERY THAT REVERSES CANCER AND DEGENERATIVE DISEASES

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FOREWORD

Deepak Chopra, M.D.

It's a natural part of any discovery to find yourself lying awake at night, settling down from the excitement of a breakthrough, and saying to yourself, "If I'm right, this changes everything." Most of the time, however, everything doesn't change. If the discovery winds up being accepted, you might be fortunate, and a few things will change.

The ideas forwarded in this new book by Ervin Laszlo and Pier Mario Biava are rare, even in a rapidly changing landscape where science is reevaluating time-honored concepts on every side. The seed idea of "in-formation" has the potential to change everything—for real. The first headline that is likely to emerge from the breakthrough described in these pages will focus on cancer. The clinical results with advanced liver-cancer patients detailed in part two are startling. But I'd like to dwell for a moment on the larger implications of "in-formation," because in fact cancer treatments and all the other medical applications described in this book, hugely promising as they are, only hint at a paradigm shift that could break open our accepted notion about what is real.

The "real" reality isn't an issue for 99 percent of working scientists, or a large percentage of nonscientists, because they have found a work-around that keeps daily life flowing in

well-worn grooves. Scientists and nonscientists alike navigate the day trusting the evidence of the five senses—accepting as a given the physical world "out there." This is a work-around because the quantum revolution more than a century ago caused the substantial, hard-edged, solid physical world to vanish. What the five senses report, and the notion of tiny, tiny things (atoms and molecules) that pile up to form big, big things (stars and galaxies) was negated once and for all.

This discovery, which has been described endlessly since the pioneering era of Einstein, Heisenberg, Schrödinger, and their brilliant colleagues, got sidelined by everyday life. The entire universe may vanish into an invisible dimension devoid of time, space, matter, and energy, but that obviously isn't visible when you drive your car to work or watch a sunrise. The continuity of the world that we occupy every day undermines any abstruse theory about reality. This has remained true decades after the eminent astronomer and physicist Sir Arthur Eddington drily noted, "It is difficult for the matter-of-fact physicist to accept the view that the substratum of everything is of mental character." And working science, including medicine, has turned its back on the insight of another eminent physicist, Sir James Jeans, who is worth quoting at length: "The universe begins to look more like a great thought than like a great machine. Mind no longer appears to be an accidental intruder into the realm of matter . . . we ought rather to hail it as the creator and governor of the realm of matter."

Laszlo and Biava return us directly to this insight, and the reason their book has a chance to change everything is that they provide an entry into everyday life. They have clinical

proof for turning on its head the accepted default that we are biological machines that some-how learned to think. Rather, we are minds that learned how to create a body.

The authors invoke the late British physicist David Bohm, who spent his career maintaining that the visible order observable in the created universe, from the level of quantum activity to the most evolved forms, including human DNA, was controlled by an invisible organizing principle or force. This invisible agency exists outside time and space, but it informs every structure in creation, and to that end Bohm devised the term "in-formation." As intriguing as his idea was —this entire book is devoted to showing exactly how right he happened to be—there was widespread resistance among fellow physicists.

The reasons for this, aside from sheer prejudice and mental laziness, came down to a clash with long-accepted assumptions that formed a kind of Chinese wall against Bohm's insight. One assumption is that matter is more real than mind; another is that reality must be broken down into measurable units. Bohm couldn't actually point to a measurable force or offer any material evidence for in-formation. His chief ally, intellectually speaking, was negative logic. Without in-formation, there was no viable way to explain the intricacies of evolving forms in the universe and the astonishing complexity of their design. But luck wasn't with him in a context where "design" had become a poisoned word in science, thanks to reactionary religious fundamentalists.

Whole books have been devoted to the relationship of mind and matter, how consciousness came about, and where

the universe, along with life on Earth, is evolving. Biava and Laszlo have made a wise decision by talking to other scientists, including the medical community, in terms they already accept. Climbing down from the ladder of philosophy, they present hard evidence. Surely this is the right path, for the time being. The Chinese wall that kept Bohm isolated until his death in 1992 won't crumble until consciousness is taken seriously as a viable subject of research, because the terms Bohm had to use in order to communicate—mind, matter, force, agency, and so on—are red herrings when the "real" reality is consciousness.

This book isn't the first to found its ideas on the age-old realization that the two worlds, "in here" and "out there," are entirely created from and by consciousness endlessly changing and yet always maintaining a level of continuity. No matter how different a star, a sea snail, a tree fern, and a newborn baby appear, each is a modification of innate qualities that inhere to consciousness: intelligence, self-awareness, creativity, evolution, and wholeness. All are implied by the term "in-formation," because it is the medium by which every quality of consciousness is made manifest.

In-formation is the invisible glue that keeps your body from flying apart into a whirling cloud of disorganized, chaotic particles, blowing in the wind like a dust storm. In a way, the existence of in-formation is self-evident, making it baffling to look around and see broken-down materialism, outmoded a century ago, still persisting as the default attitude of all but a few. Laszlo and Biava have made a major contribution to the paradigm shift that will inevitably come, and when it arrives, they will deserve a large measure of

acknowledgement from all sides.

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Preface

The book in the hands of the reader introduces a major discovery in the field of medicine. This discovery is not a unique and disconnected element in the history of medicine: it is a logical corollary of the advance of knowledge in the field of science as a whole. This advance is what we call "the new paradigm." The discovery on which we report here is both a fruit of this advance and a brilliant testimony to its validity. The new discovery in medicine, and therewith science's new paradigm, impacts all aspects of our life. Hence this book is addressed to both the medical professional and to all people concerned with the way we care for our health and treat disease.

Part one introduces the new discovery in medicine as a particular, and particularly important, application of the new paradigm in science. The new paradigm presented in chapter I revisits and revalidates some perennial insights. The living organism is a seamless whole: it is a "cognitive network" that functions by receiving and elaborating information. The information it receives is more than the ensemble of humanly produced messages: it is the cosmic "in-formation" discussed by quantum physicist David Bohm.

The reception and elaboration of "in-formation" in a living system is the key to its health and viability, but this in-formation is not always fully and correctly received. This flaw can be rectified. Chapter II offers a concise review of the

groundbreaking experiments, identifying the power of in-formation medicine to treat and cure some hitherto untreatable and incurable diseases. Chapter III offers assessments by leading experts in the field, highlighting the epochal significance of the advent of in-formation medicine.

Part two is dedicated to the documentation and validation of this revolution in medicine, providing the basis for further research and development. It presents the research that has led to the new discovery and discloses the method and the tools for making it an effective instrument for curing disease and maintaining health.

The new discovery could open a new era of well-being for humanity—an era that could free millions from the curse of diseases that make life nasty, brutish, and short, to cite the words of philosopher Thomas Hobbes.

This book has a two-fold message—a basic worldview message of insight into a new (or perhaps merely newly rediscovered) way of perceiving life, health, and disease, and a practical message disclosing the ways we can henceforth maintain health and treat disease. We trust that it will make a meaningful contribution toward achieving better health and a higher quality of life for people wherever they live on this planet.

PART ONE

THE BREAKTHROUGH

CHAPTER I

The New Paradigm in Science and Medicine

We seek the simplest possible scheme of thought that can tie together the observed facts.

ALBERT EINSTEIN

There is a widely discussed "paradigm shift" underway today. It brings a two-fold revolution—actually parallel strands of a radical "evolution." First and most basically, an evolution in our understanding of the fundamental nature of the world. Second, a logically entailed but still largely independently researched evolution in our understanding of the nature of health and disease. We consider both (r)evolutions, and begin with a review of science's emerging understanding of the world.*[1]

The new concept surfacing at the cutting edge of science is radically new and at the same time millennia old. It is new in relation to the dominant paradigm in science and society, but it is old in its "re-cognition" of intuitions that have

hallmarked inquiry into the nature of reality for thousands of years.

The classical paradigm is the inheritance of Newtonian physics. In light of that paradigm the world consists of individual bits of matter interacting in passive space and indifferently flowing time. This view has been challenged by the "relativity revolution" in the first decade of the twentieth century and by the "quantum revolution" in the third. The paradigm emerging today consolidates these revolutions. It sees the world as a whole system in which all things in their ensemble constitute an entangled macroscopic quantum system. The "global realism" of the new paradigm contrasts with the "local realism" of the old. In the old paradigm, all things occupy unique positions in space and time and are affected only by local forces transmitted through mechanistic interactions. By contrast, in the perspective of global realism, all things are instantly and mutually "entangled" across all points of space and intervals of time.

THE NEW PARADIGM IN PHYSICS

In light of the concept emerging at the frontiers of the physical sciences, the universe is not an arena for structures and entities of matter moving in passive space and indifferently flowing time. As astrophysicist James Jeans noted over a hundred years ago, the universe is more like a great thought than like a great rock.

The concept of a thought-like universe is familiar from the annals of history. Philosophers, scientists, and intuitive people in all walks of life have often questioned that the

world would be just as it is presented to our senses. The intuition that it is more thought-like than rock-or machine-like proved to be well founded. The universe is not an ensemble of separate bits of matter obeying mechanistic laws, but an intrinsically whole macroscopic quantum system where all things are in-formed and interconnected beyond the conventional bounds of space and time.

In the new paradigm of physics, the things that exist and persist in the world are sets and clusters of vibrating energy. These clusters are what we experience as the physical furnishings of space and time.

The idea of the world as vibration has been known to the classical wisdom traditions. It was present in the Sanskrit concept of Akasha and was taken up in the Vedic texts of India as early as 5000 BCE. In the Vedas its function was identified with *shabda*, the first vibration, the first ripple that constitutes the universe, and also with *spanda*, the "vibration/movement of consciousness." The contemporary Indian scholar I. K. Taimni wrote, "There is a mysterious integrated state of vibration from which all possible kinds of vibrations can be derived by a process of differentiation. That is called *N.da* in Sanskrit. It is a vibration in a medium which may be translated as 'space' in English. But it is not mere empty space but space which, though apparently empty, contains within itself an infinite amount of potential energy."[1]

This traditional notion is sustained and elaborated at the cutting edge of quantum physics. Research on the ultrasmall dimensions of the universe reveals that space is not empty and smooth, but filled with waves and vibration. At the

subquantum level physicists do not find anything they could identify as matter. What they find are standing and propagating waves—clusters of stationary and propagating vibration.

Previously scientists assumed that it is matter that vibrates. There is a ground substance that vibrates, and that substance consists of matter-particles and assemblies of matter-particles. The world is material, and vibration is the way matter behaves. But the contrary turned out to be the case. There is no ground substance. The universe is a system of variously complex and coherent clusters of vibrant energy, and matter is just the way the vibrations appear on observation.

The great physicist Max Planck said this clearly. In one of his last lectures in Florence, he noted, "As a man who has devoted his whole life to the most clear-headed science, to the study of matter, I can tell you as a result of my research about atoms this much: There is no matter as such. All matter originates and exists only by virtue of a force which brings the particles of an atom to vibration and holds this most minute solar system of the atom together."[2]

Planck was not alone in stating the concept of the universe as force and vibration. Two years prior to Planck's pronouncement, the maverick genius Nikola Tesla said that if you want to know the secrets of the universe, think in terms of energy, frequency, and vibration.

In the second decade of the twenty-first century, the materialist concept of the physical world has been definitively transcended. The new physics tells us that it is

not from bits of matter but from clusters of ordered energy-vibration that the things we find in the world are built. Ordered vibrations make the furnishing of the universe into what it is: a system of coherent entities and processes, rather than a welter of random unconnected events.

The vibrations that surface in the universe are a consequence of the excitation of the ground state of a wider reality. The universe is no longer considered to be all that is. It is the phase and domain of a wider reality we can best call *cosmos*. The excitation of the cosmos was most likely the effect of the Big Bang. The energies released in that singularity polarized the cosmic ground state and brought it into vibration. The phenomena we observe in the space-time universe are clusters of vibrations of the polarized cosmic ground state. The vibrations are spatially as well as temporally related, and their relations introduced space and time into the undifferentiated oneness of the cosmic ground state. The universe we observe is a spatial and temporal domain of spatially and temporally related clusters of vibration.

The vibrations that emerged fill the space-time of the universe. As far as we know, there is no empty space and no empty interval in the universe. Space is a foaming, turbulent medium filled with fields and forces. The term "vacuum" does not apply to it: it is a *plenum*.

The observed, and in principle observable, dimension of the universe is the ensemble of the vibrations resulting from the excitation of the cosmic ground state. Everything we perceive and observe is a pattern or cluster of vibration created by the excitation of that primordial state. The known

and knowable clusters range in size and complexity from quarks and quanta to biological organisms, and from biospheres and planets to galaxies and the metagalaxy. They are particulate entities, but their particularity does not signify separateness. The clusters of vibration in and of the ground state are nonlocal. They are locally differentiated but globally "entangled" elements of the sea of vibration that patterns the ground state of the cosmos.

THE NEW PARADIGM OF EVOLUTION

An estimated 13.8 billion years before our time, the Big Bang excited the ground state of the cosmos and produced ripples in what must have been a seamless primordial state. The ripples were sets of vibrations of coinciding phase and frequency, forming cognizable and re-cognizable "things" against a "background" of undifferentiated, seemingly chaotic vibration. The thing-like clusters interacted and created ever larger and more structured and differentiated "macro-things." These are what we perceive as the material furnishings of the universe. They come into being in the processes of progressive ordering and structuring we call evolution.

Evolution took off in the universe following the inflow of the staggering energies released by the Big Bang. Coherent clusters of vibrations were created, and they produced integral, relatively enduring clusters. Physicists know these clusters as *leptons* (electrons, muons, tau particles, and neutrinos), *mesons* (pions), and *hadrons* (baryons, including protons and neutrons). In the course of time they formed

more complex clusters: the atoms of the elements. Atoms in turn clustered into molecules and molecular assemblies. The clusters that appeared as quantized micro-particles attracted or repulsed one another and created larger and more complex entities. On the astronomical level these appear to us as stars, stellar systems, and galaxies.

Evolution manifests in perceptible form the ensemble of the laws and regularities that make the universe into what it is: a nonrandom, and at least partly intelligible, domain of space and time.

In modern science, thanks to the work of Darwin and Wallace, evolution was first recognized in the domains of life. Its recognition as a cosmological process had to wait until the first decades of the twentieth century, when Einstein's hopes for an eternally unchanging matrix-universe proved illusory and time entered as a factor in the cosmological equations. Through the work of physicists such as Willem De Sitter and Stephen Hawking, and of thermodynamicists Ilya Prigogine and Aharon Katchalsky, nonlinear but overall irreversible change came to be seen as fundamental in the universe. It appeared that evolution encompasses not just the living world, but the world as a whole.

The factor in the cosmos that structured and evolved first the physical and then the living world was not clearly understood. Physicist Henri Bergson speculated that it is an *élan vital* that counters the trend toward energy-degradation in complex systems, and biologist Hans Driesch suggested that it is a counter-entropic drive he termed *entelechy*. Philosophers Teilhard de Chardin and Erich Jantsch postulated a dynamic tendency called *syntony*, and others

gravitational force, which is approximately 10^{40}, is matched by the ratio between the size of the universe and the dimension of elementary particles: that ratio, too, is approximately 10^{40}. It is not evident how these ratios could have been produced, and then maintained, by random processes. The ratio of the electric force to the gravitational force should be unchanging (as these forces are constant), whereas the ratio of the size of the universe to the size of elementary particles should be changing (since the universe is expanding). In his "large number hypothesis," Dirac speculated that the agreement between these ratios, one variable and the other not, is more than coincidence. Either the universe is not expanding or the force of gravitation varies with its expansion.

Cosmological research unearthed an entire array of similarly mind-boggling elements of coherence. The mass of elementary particles, the number of particles, and the forces between them display harmonic ratios. Many of the ratios among basic parameters can be interpreted on the one hand in reference to the relationship between the mass of elementary particles and the number of nucleons (particles of the atomic nucleus) in the universe, and on the other in reference to the relationship between the gravitational constant (the factor of gravitation in the evolution of the universe), the charge of the electron, Planck's constant (a unit of measurement used to calculate the smallest measurable time interval and physical distance), and the speed of light.

Also the microwave background radiation—the remnant of the Big Bang—turned out to be unexpectedly coherent. When

one maps its sequence of values, there are peaks and troughs, and these follow a definite, nonrandom logic. There is a large peak followed by smaller, harmonic peaks. The series of peaks ends at the longest wavelength that physicist Lee Smolin termed R. When R is divided by the speed of light we get the length of time that independent estimates tell us is the age of the universe. When we divide the speed of light by the value of R (c/R), we get the frequency that equates to one cycle over the age of the universe. And when R is squared and divided by the speed of light (R^2/c), we get the value equal to the acceleration of the expansion of the distant galaxies.

These observations are more than coincidental. The universe is coherent beyond expectation, and its coherence allows life to emerge on suitable surfaces. Life requires a universe of which the basic parameters—the "physical constants"—are precisely and enduringly correlated. Variation of the order of one-billionth of the value of some of these constants (such as the mass of elementary particles, the speed of light, the rate of expansion of galaxies, and two dozen others) would have resulted in a sterile, lifeless universe. Even a minute variation would have prevented the creation of stable atoms and stable relations among them, and this would have precluded the evolution of the complex systems that manifest the characteristics of life. Yet living systems show up in more and more places in the universe, under more and more diverse conditions.

The clusters of vibration that are the fundamental reality of the universe create in-phase, harmoniously structured ensembles that observers such as the human perceive as material—more exactly, matter-like—structures. It appears

that the universe evolves under the influence of coherence-generating dynamic attractors. What we observe today is a highly coherent ensemble of clusters of vibration, appearing to us as a universe of staggeringly coherent quasi-material structures.

Not only is the universe as a whole a system of coherent structures; it is also the ground or template for the evolution of a vast array of subsidiary ensembles of coherent clusters of vibration—coherent structures, ranging in size and complexity from atoms to galaxies. These complex and yet coherent clusters could not have come about through a random mixing of their components. Statistical analysis of the complexity of even relatively simple biological systems indicates that to produce them by a random mixing of their components would have taken on the average longer than the age of the universe.

The complexity of the DNA-mRNA-tRNA-rRNA transcription and translation system is such that the probability that living systems would have been produced by random processes is astronomically improbable. Its probability, according to mathematical physicist Fred Hoyle, is equal to that of a hurricane blowing through a scrapyard and assembling a working airplane. Even 13.8 billion years for the evolution of matter-like structures in the physical domain and four billion or more years for the appearance of living systems are not sufficient to account for the presence of stars and galaxies, and the complex and supremely harmonious web of life on this planet.

If random interactions cannot account for the existence of the coherent complex systems we encounter in the universe,

we need to recognize the presence of attractors acting on phenomena in space and time. The explanation of their origins and nature is secondary to the affirmation that they exist. Their existence is consistent with the quantum theory developed by physicist David Bohm. According to Bohm, the observed "explicate order" is "in-formed" by the underlying "implicate order." The implicate order is the attractor that governs—"in-forms" in Bohm's theory—the unfolding of events in the explicate order.

The implicate order is the beyond-space-time domain of laws and regularities that govern events in space and time. These laws and regularities are "beyond" the space-time universe in the sense in which the laws of chess, for example, are beyond the games played according to those laws. The laws govern the way the games are played but are not part of the games. They do not physically move the pieces on the board—rather, they regulate the way the pieces can be legitimately moved. The effect of the implicate order on the explicate order is in the form of "active information"—meaning "in-formation." It does not involve physical action such as the action of a force field, whether electric, magnetic, gravitational, or nuclear.

The effect of the attractors (that is, of the implicate order) is universal: it in-forms the entire space-time domain. It is irreducible and illimitable: there are no entities or processes that could be shielded and exempted from it. It is the governing, ordering, and structuring factor religious-spiritual traditions identify as the will of God, Tao, Brahman, or the Great Spirit. It is the factor that makes the universe what it is: an evolving nonrandom system of individually as well as

collectively coherent entities and events. In the here suggested conceptual frame, it is the formative ("in-forming") action of dynamic attractors on the space-time universe.

INFORMATION MEDICINE: THE NEW PARADIGM IN HEALTH AND HEALING

Things and events in the universe are not haphazard and chaotic: they are formed—"in-formed"—by universal attractors. The recognition that the manifest world, and thus the living organism, is "in-formed," suggests a new definition of bodily health and disease.

The New Definition of Health and Disease

Health is the full (or at any rate adequate) condition of in-formation in the living organism. Disease is the condition of blocked, reduced, or otherwise flawed in-formation. Healing, then, is the reestablishment of the condition of full (or adequate) in-formation.

The task of medicine is to heal by reestablishing a condition of adequate in-formation in the organism. This does not necessarily call for artificial measures; in many cases, it can be performed by recourse to the in-formation already present in nature. In the global context, doing so is to access and abide by what the religions call the will of a supreme intelligence. In the context of healing, it is equivalent to accessing what the Eastern healing arts name

b) Interactions in the organism form a complex integral network of relationships that make up nonlocally correlated wholes; the properties of organisms are intrinsically nonlocal.

c) The organism is a whole in regard to its parts, and it is a part in regard to its environment, which is a whole constituted of its multiorganic parts. It is at the same time a part of the larger system, which is the system of life on the planet. A single synchronic scheme connects the macroscopic world of living organisms with the microscopic world of quantum particles.

d) Living organisms are nondecomposable quantum systems. The correlations that connect their elements are destroyed when their parts are separated from each other and from the systems that embed them.

e) In the mathematical formalism of quantum physics, relations between the parts of the whole system are expressed in terms of probability, and the probabilities are determined by the dynamics of the system in which they occur. Thus concepts of "entanglement" apply to living organisms, which are entangled quantum-systems entangled with other organisms in the biosphere.

The Task of Information Medicine

Information medicine upholds many of the insights that hallmark the wisdom traditions. First and foremost it "re-cognizes" the vital role of contact with nature—and hence with the universal attractors present in nature—in preserving the health and integrity of the organism.

The task of information medicine is to purposively further the preservation or restoration of coherence within the organism as well as between the organism and its environment. In traditional societies this task involved restoring contact between individual organisms or tribes and their natural environment. It was entrusted to shamans, gurus, and medicine men and women. In the modern world, the preservation and restoration of health is the task of medical doctors and other health professionals. They apply a wide range of health technologies that substitute for direct contact with nature.

However, the health-preserving and restoring effects of contact with nature, known for millennia, are irreplaceable, and they are being rediscovered. For example, the practice of "forest bathing" (*shinrinyoku*), originating in traditional Japan, is spreading in the modern world. It is found to bring significant health benefits: lowering heart rate, reducing blood pressure, reducing stress hormone production, and improving overall well-being. Thomas Miller, editor of the Findhorn Foundation's magazine, noted: "Studies have linked even relatively small amounts of time spent in nature to better mental health, improved empathy, lengthened attention span and boosted immune system, to name only a few benefits. As more artists, writers, business people and others wake up to the benefits of 'forest bathing,' nature retreats and other ways of immersing themselves in nature, they are finding that their creativity and inspiration return."[4]

As the clinical studies cited in part two of this book testify, effective contact with natural substances that convey whole-system in-formation to the diseased organism produces

remarkable healing effects. It cures, or at least increases resistance to, a wide array of autoimmune and degenerative maladies, including tumoral diseases and diseases of the cardiovascular system, the nervous system, and the digestive system. It slows the processes of cellular senescence and extends the span of healthy human life. Contact with nature furnishes the kind of guidance that the GPS (global positioning satellite) does in regard to position on the surface of the planet. This guidance is produced by nature and not by man-made technology, and it concerns the coherence—the health—of the subject and not its spatial position.

Clear and robust contact with nature is becoming difficult to achieve. This is due partly to access to nature becoming more and more remote for people in cities, and partly to the compromised quality of the nature to which people have access. As a result fewer people practice effective forest bathing, nature meditation, and other ways of entering into contact with nature. Such contact as they do achieve often proves insufficient to maintain or to regain their health.

For modern people, contact with pristine nature is becoming well-nigh impossible to achieve, and our health suffers the consequences. Not surprisingly, a significant number of compensatory measures are being developed. Modern medicine is largely focused on applying compensatory measures. Faced with a disease, or a condition of less than optimum health, physicians turn to biochemical remedies, to radiation therapy, and if necessary to surgery, to reestablish the coherence of the organism.

Modern medicine's therapeutic measures offer cures to scores of ailments, but they are not the simplest and the most

effective way to preserve and restore health. A simpler and more effective way is to bring to the organism the in-formation that would in-form it in nature. The effectiveness of doing so is shown by the technical studies published in chapter two, "Information Medicine in Clinical Practice." It appears that introducing extracts from the embryo of a living organism—in this case, a Zebrafish—into a diseased or imperfectly developed organism amounts to bringing whole-system in-formation to that organism. These complex in-formation-carrying proteins exhibit remarkable healing powers: they act as stem cell differentiation stage factors (SCDSFs), reprogramming human pathological stems cells to normalcy. Reprogramming stem cells prolongs the life cycle of normal cells, reinforces the cellular and organic vitality of the organism, and slows the growth of imperfectly differentiated mutant cells.*[2]

This in-formation-based therapy promises to be the basis of an effective, efficient, and low-cost medical technology coming online in the foreseeable future.

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processes information in all species of organism, including the simplest unicellular species.

As already noted, the living organism is more than the sum of its parts. The integrality of the organism ensures that the various chemical and physical-chemical reactions are not expressions of separate events but result from the fine-tuning of the organism to its intrinsic and extrinsic (internal and external) environment. It allows molecules and cells to adopt behaviors corresponding to their location within the system.

The differentiation of DNA is indispensable for the reprogramming of dysfunctional or downright malignant tumor cells toward benign behavior. To understand why, we need to look at what is happening in the body following the absorption of synthetic molecules—structures that do not exist in nature.

Let us suppose that an unnatural and for the organism unfamiliar substance produces toxic effects. Although it comes into contact with this substance for the first time, the liver, which is the organ of detoxification, is able not only to recognize the form of the message received from the unfamiliar substance but to understand the nature of its content. If the substance is toxic, cells in the liver activate one of the systems of detoxification. These activate in turn biotransformative processes that render the substance harmless. This process can take place because the differentiation of the cells that produces a new organism is a process of "cellular cognition."

Liver cells, for example, the same as other cells in the organism, have alternatives, and they make their choice among them on the basis of the signals received from the rest

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Note to the reader: *This book is intended as an informational guide. The remedies, approaches, and techniques described herein are meant to supplement, and not to be a substitute for, professional medical care or treatment. They should not be used to treat a serious ailment without prior consultation with a qualified health care professional.*

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